Cadmium and Cadmium Compounds

Chemical Information
CAS Number - 7440-43-9
General Uses – Cadmium, used in this country, is obtained as a by-product from melting zinc, lead, or copper ores. The cadmium by-product is used in metal plating and to make pigments, batteries and plastics.
Potential Hazards - Cadmium and its salts are highly toxic. Breathing high levels of cadmium severely damages the lungs and can cause death.

Summary Analysis– Cadmium and Cadmium Compounds

- In 2003, cadmium and cadmium compounds accounted for about 1 percent of the total quantity of PCs, with a total of 817,579 pounds. There was approximately a 26 percent decrease in the PC quantity of cadmium and cadmium compounds reported from 1999 to 2003.
- Eleven of the 67 facilities that reported cadmium and cadmium compounds in 2003 accounted for 90 percent of the total quantity. One facility accounted for almost 46 percent of the total quantity of this chemical.
- Virtually the entire quantity of cadmium and cadmium compounds was land disposed.
- Over 90 percent of cadmium and cadmium compounds was reported by facilities in 4 Regions (Regions 3, 4, 6, and 10). Facilities in Region 6 accounted for over 47 percent of the total quantity.
- Facilities in 29 states reported a PC quantity of cadmium and cadmium compounds in 2003. Facilities in 8 of these states reported over 90 percent of the total quantity in 2003 with 1 facility in Oklahoma accounting for over 45 percent of the total quantity.
- Six industry sectors (SIC codes) accounted for over 90 percent of cadmium and cadmium compounds reported in 2003. Facilities in SIC 3341 (Secondary nonferrous metals) reported the highest quantities, accounting for 53 percent of the total priority. Most of this quantity was reported by one facility, located in Oklahoma, with about 86 percent of the cadmium and cadmium compounds for this industry sector.

National Trends – Cadmium and Cadmium Compounds. Exhibit 4.44 shows that the number of facilities that reported cadmium and cadmium compounds from 1999 through 2003 has been relatively constant, with 67 facilities reporting in 2003. It also shows that, in 2003, there was an almost 26 percent decrease in the total PC quantity (pounds) of cadmium and cadmium compounds, compared to 1999. Virtually all of the cadmium and cadmium compounds was sent to land disposal.

Exhibit 4.44. National-Level Information for Cadmium and Cadmium Compounds (1999-2003)

	1999	2000	2001	2002	2003	Percent Change (2000-2003)	Management Method -- Percent of Quantity of this Chemical in 2003
Number of Facilities	73	80	70	72	67	-6.8%	
Disposal Quantity (lbs.)	1,063,795	1,356,083	919,994	744,975	817,338	-23.2%	100.0%
Energy Recovery Quantity (lbs.)	212	0	0	0	0	-100.0%	0.0%
Treatment Quantity (lbs.)	39,781	132,613	12,499	4,595	241	-99.4%	0.0%
Priority Chemical Quantity (lbs.)	1,103,788	1,488,696	932,493	749,570	817,579	-25.9%	
Recycling Quantity (lbs.)	522,513	748,270	469,405	420,139	888,819	70.1%	

Exhibit 4.45 shows the number of facilities that reported cadmium and cadmium compounds, within ranges of quantities. Of the 67 facilities that reported cadmium and cadmium compounds in 2003, one facility accounted for almost 46 percent of the total quantity of this chemical. Eleven of the 67 facilities accounted for 90 percent of the total quantity.

Exhibit 4.45. Distribution of Facilities that Reported Quantities for Cadmium and Cadmium Compounds (2003)

Cadmium and Cadmium Compounds (817,579 pounds)		
Quantity Reported	**Number of Facilities Reporting this quantity (2003)**	**Percent of Total Quantity for this Priority Chemical**
up to 10 pounds	14	less than 0.1%
between 11 - 100 pounds	11	0.1%
between 101 -1,000 pounds	16	0.9%
between 1,001 - 10,000 pounds	15	9.1%
between 10,001 - 100,000 pounds	10	44.4%
between 100,001 - 1 million pounds	1	45.6%
> 1 million pounds	0	0.0%

EPA Region Trends– Cadmium and Cadmium Compounds. Exhibit 4.46 shows the quantity (pounds) of cadmium and cadmium compounds reported by facilities in each EPA Region in 1999 to 2003. In 2003, facilities in 4 Regions (Regions 3,4, 6, and 10) reported about 90 percent of the cadmium and cadmium compounds; Region 6 facilities accounted for over 47 percent of the total quantity. Decreased quantities of cadmium and cadmium compounds were reported by facilities in 7 of the 10 Regions. Exhibit___ also shows the distribution of cadmium and cadmium compound quantities across EPA Regions as well as the distribution of facilities reporting this chemical in 2003. No facilities in Region 8 reported this PC.

Exhibit 4.46. Quantity of Cadmium and Cadmium Compounds Reported by EPA Regions (1999-2003)

EPA Region	1999	2000	2001	2002	2003	Percent Change in Quantity (2000-2003)	Percent Of the Total Priority Chemical quantity (2003)
1	13,963	50,835	32,866	5,972	4,271	-69.4%	0.5%
2	14,285	26,073	34,434	28,462	8,466	-40.7%	1.0%
3	137,468	157,948	103,399	68,629	80,042	-41.8%	9.8%
4	162,672	169,707	113,933	102,782	170,480	4.8%	20.9%
5	107,505	209,382	61,863	36,153	48,468	-54.9%	5.9%
6	187,325	366,447	267,921	285,057	386,453	106.3%	47.3%
7	4	43,620	17,905	17,851	11,024	275500.0%	1.3%
8	5,653	695	251	0	0	-100.0%	0.0%
9	5,233	4,029	3,799	7,262	1,818	-65.3%	0.2%
10	469,680	459,960	296,122	197,402	106,556	-77.3%	13.0%
Total	**1,103,788**	**1,488,696**	**932,493**	**749,570**	**817,579**	**-25.9%**	**100.0%**

Exhibit 4.47. Distribution of Facilities Reporting Cadmium and Cadmium Compounds and Quantity of Cadmium and Cadmium Compounds Reported, by EPA Region (2003)

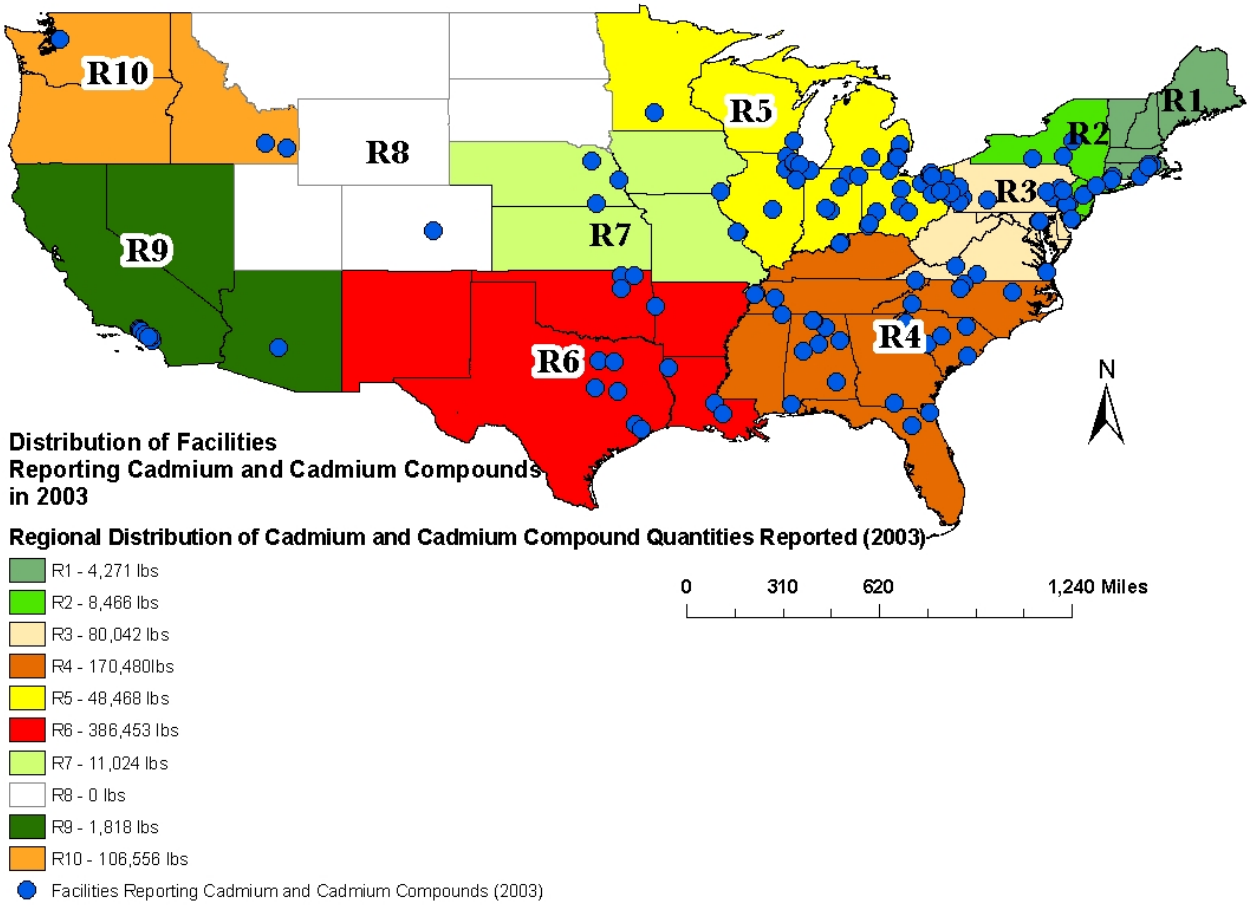


Exhibit 4.48 shows how cadmium and cadmium compounds were managed by facilities within each EPA Region in 2003. Virtually the entire quantity of the cadmium and cadmium compounds was land disposed, primarily by offsite disposal (83 %). There also was significant recycling of cadmium and cadmium compounds by facilities in many of the Regions.

Exhibit 4.48. Management Methods for Cadmium and Cadmium Compounds, By EPA Region (2003)

EPA Region	Disposal		Energy Recovery		Treatment		Recycling	
	Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
1	0	4,271	0	0	0	0	0	1,700
2	0	8,466	0	0	0	0	5,288	3,020
3	4	79,797	0	0	0	241	5,116	464,132
4	51,739	118,741	0	0	0	0	22,008	149,117
5	0	48,468	0	0	0	0	164	2,306
6	32	386,421	0	0	0	0	51,931	81,298
7	0	11,024	0	0	0	0	0	6,647
9	0	1,818	0	0	0	0	60,186	35,906
10	87,000	19,556	0	0	0	0	0	0
Total	138,775	678,563	0	0	0	241	144,693	744,126

State Trends– Cadmium and Cadmium Compounds. Facilities in 29 states reported a PC quantity of cadmium and cadmium compounds in 2003. Exhibit 4.49 shows the quantity of cadmium and cadmium compounds reported by facilities, in those 8 states with facilities that accounted for over 90 percent of the total quantity in 2003. One facility in Oklahoma reported over 45 percent of the total quantity of cadmium and cadmium compounds. Although facilities in Idaho reported 13 percent of the total quantity in 2003, there was a decrease of over 77 percent, compared to the 1999 quantity. Facilities in Florida, South Carolina, Indiana, and Maryland had significant increases, compared to 2002 quantities. Maryland, in particular, had a considerable increase since 1999 – from 69 pounds to almost 67,000 pounds. (Exhibit 4.50).

Exhibit 4.49. State-Level Information for Cadmium and Cadmium Compounds (1999-2003)

State	1999	2000	2001	2002	2003	Change in Quantity (2000-2003)	Percent Change in Quantity (2000-2003)	Percent of Total Quantity of this Priority Chemical (2003)
Oklahoma	144,903	298,496	227,190	268,060	372,766	227,863	157.3%	45.6%
Idaho	469,620	459,895	296,122	197,402	106,556	-363,064	-77.3%	13.0%
Alabama	92,491	79,728	73,543	78,137	77,169	-15,322	-16.6%	9.4%
Maryland	69	29	42,923	41,171	67,064	66,995	97094.6%	8.2%
Florida	63,198	59,490	17,510	4,440	52,810	-10,388	-16.4%	6.5%
South Carolina	986	15,728	7,752	4,201	25,029	24,043	2438.4%	3.1%
Indiana	6,010	3,051	14,444	9,428	22,825	16,815	279.8%	2.8%
Tennessee	3,114	11,127	11,910	12,159	13,562	10,448	335.5%	1.7%

Exhibit 4.50. Cadmium and Cadmium Compound Significant Quantity Trends (1999-2003): Facilities in Idaho and Oklahoma

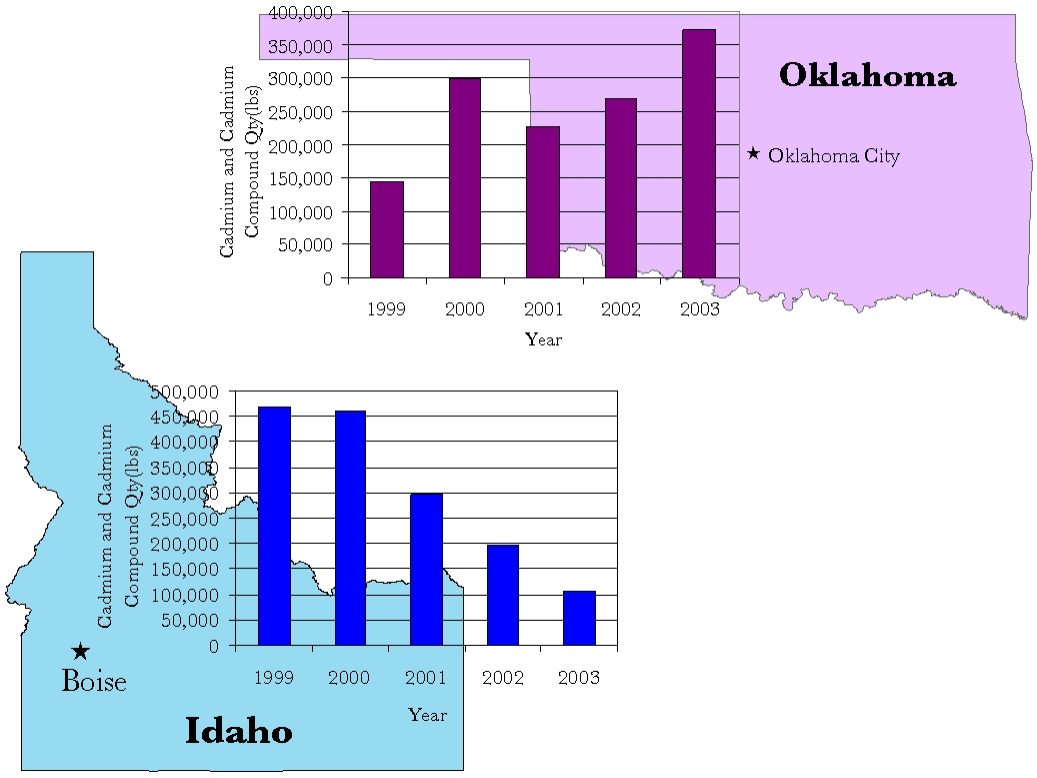
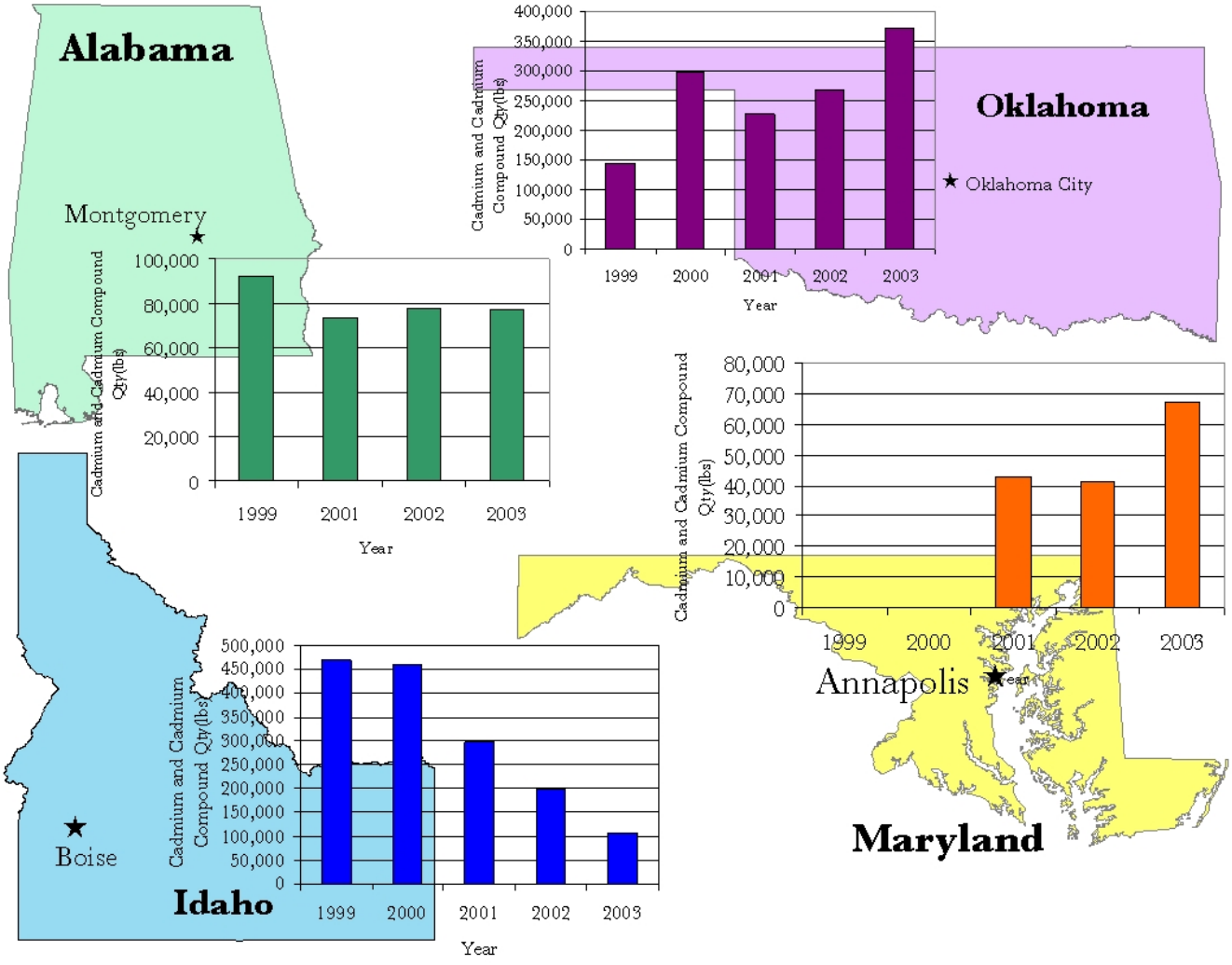


Exhibit 4.51 shows how cadmium and cadmium compounds were managed by facilities in the 8 states that accounted for over 90 percent of the total quantity of this PC in 2003. All of the cadmium and cadmium compounds from facilities in these states was land disposed, mostly offsite. Recycling of notable quantities of cadmium and cadmium compounds occurred in several of the states, including Alabama, Tennessee, and Oklahoma.

Exhibit 4.51. Management of Cadmium and Cadmium Compounds in States with 90 Percent of Total Quantity (2003)

State	Total Priority Chemical Quantity (2003)	Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
Oklahoma	372,766	31	372,735	0	0	0	0	0	31,232
Idaho	106,556	87,000	19,556	0	0	0	0	0	0
Alabama	77,169	38,437	38,732	0	0	0	0	6,328	49,778
Maryland	67,064	0	67,064	0	0	0	0	0	0
Florida	52,810	0	52,810	0	0	0	0	0	500
South Carolina	25,029	0	25,029	0	0	0	0	0	7,463
Indiana	22,825	0	22,825	0	0	0	0	0	828
Tennessee	13,562	13,302	260	0	0	0	0	12,230	39,646
Total		**138,770**	**599,011**	**0**	**0**	**0**	**0**	**18,558**	**129,447**

Exhibit 4.52. Trends Analyses of States with 90 Percent of Total Quantity (2003)



Industry Sector (SIC) Trends– Cadmium and Cadmium Compounds. Exhibit 4.53 shows the PC quantity (pounds) of cadmium and cadmium compounds for the six industry sectors (SIC codes) where facilities reported over 90 percent of this chemical in 2003. Facilities in SIC 3341 (Secondary nonferrous metals) reported the highest quantities, accounting for 53 percent of the total PC quantity of cadmium and cadmium compounds reported in 2003. This industry sector had a significant increase compared to quantities reported in both the 1999 and 2002. About 86 percent of this SIC 3341 quantity was reported by one facility, located in Oklahoma. Facilities in SIC 2819 (Industrial inorganic chemicals, nec) industry sector reported the second highest quantity of cadmium and cadmium compounds in 2003 but has experienced a steady decline in the quantity since 2000. Except for SIC 2824 (Organic fibers, noncellulosic), the other 5 top industry sectors reporting cadmium and cadmium compounds had an increased quantity in 2003.

Exhibit 4.53. Industry Sector-Level Information for Cadmium and Cadmium Compounds (1999-2003)

Primary SIC Code	SIC Description	Number of Facilities for this SIC Code (2003)	1999	2000	2001	2002	2003	Change in Quantity (1999-2003)	Percent Change (2000-2003)	Percent of Total Quantity of this Priority Chemical (2003)
3341	Secondary nonferrous metals	9	170,434	354,899	253,170	309,625	433,279	262,845	154.2%	53.0%
2819	Industrial inorganic chemicals, nec	3	470,240	504,425	314,677	199,423	98,067	-372,173	-79.1%	12.0%
2816	Inorganic pigments	2	2,635	2,891	47,677	32,072	69,032	66,397	2519.8%	8.4%
3312	Blast furnaces and steel mills	8	50,685	93,398	62,922	38,355	55,197	4,512	8.9%	6.8%
3691	Storage batteries	6	72,594	66,026	21,805	5,822	54,874	-17,720	-24.4%	6.7%
2824	Organic fibers, noncellulosic	1	60,710	47,730	44,770	40,725	35,026	-25,684	-42.3%	4.3%

Exhibit 4.54 shows how cadmium and cadmium compounds were managed by facilities in the six industry sectors that accounted for over 90 percent of the total quantity of this PC in 2003. Virtually the entire quantity of the cadmium and cadmium compounds was land disposed, primarily offsite. Facilities in SIC 2819 (Industrial Inorganic chemicals, nec) disposed about 88 percent of their cadmium and cadmium compounds onsite.

Exhibit 4.55. Management of Cadmium and Cadmium Compounds in Industry Sectors (SIC Codes) with 90 Percent of Total Quantity (2003)

Primary SIC Code	SIC Description	Total Priority Chemical Quantity	Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
3341	Secondary nonferrous metals	433,279	38,463	394,575	0	0	0	241	63,217	506,419
2819	Industrial inorganic chemicals, nec	98,067	87,000	11,067	0	0	0	0	0	0
2816	Inorganic pigments	69,032	0	69,032	0	0	0	0	0	0
3312	Blast furnaces and steel mills	55,197	13,053	42,144	0	0	0	0	6,328	81,860
3691	Storage batteries	54,874	249	54,625	0	0	0	0	59,844	138,915
2824	Organic fibers, noncellulosic	35,026	0	35,026	0	0	0	0	0	3,672

Recycling. Exhibit 4.55 provides some indication of the extent to which facilities in certain industry sectors recycled at least 100 pounds of cadmium and cadmium compounds in 1999-2003, rather than manage it as a waste. For those year(s), the facility did not report a PC quantity, i.e., a quantity managed via land disposal, energy recovery, or treatment.

Exhibit 4.55. Facilities reporting Recycling but not a Priority Chemical quantity (1999-2003)

			1999		2000		2001		2002		2003	
Number of Facilities	EPA Region	State	Onsite Recycle	Offsite Recycle	Onsite Recycle	Offsite Recycle	Onsite Recycle	Offsite Recycle	Onsite Recycle	Offsite Recycle	Onsite Recycle	Offsite Recycle
SIC 2819-- Industrial inorganic chemicals, nec												
1	7	Nebraska	0	105,000	0	0	0	0	0	0	0	0
SIC 2851--Paints and allied products												
1	5	Illinois	0	0	0	0	0	0	0	0	4,637	0
SIC 3295-- Minerals, ground or treated												
1	5	Ohio	0	840	0	429	0	1,386	0	0	0	0
SIC 3312-- Blast Furnaces and steel mills												
1	2	New York	0	840	0	429	0	1,386	0	0	0	0
1	4	South Carolina	0	0	0	0	0	0	0	2,153	2,230	2,144
1	4	Florida	0	0	0	0	0	0	0	0	0	5,531
2	4	Alabama	73,932	56,219	8,814	38,266	9,944	39,223	9,944	37,359	0	0
1	4	Kentucky	0	3,208	0	2,801	0	2,126	0	0	0	0
1	5	Indiana	0	0	0	0	0	0	0	2,400	0	0
1	6	Oklahoma	0	17,106	0	7,124	0	4,809	0	5,196	0	6,079
2	6	Texas	0	0	0	16,955	0	5,373	0	4,911	0	0
SIC 3341-- Secondary Nonferrous metals												
1	1	Massachusetts	0	16,617	0	3,440	0	0	0	0	0	0
1	6	Oklahoma	0	0	14,220	30,313	914	13,781	0	35,775	0	0
SIC 3353-- Aluminum sheet, metal, and foil												
1	5	Indiana	2,818	5,549	3,047	5,575	821	5,788	284	7,493	0	0
SIC 3357-- Nonferrous wire drawing and insulation												
1	2	New York	0	0	0	0	0	4,483	0	0	0	0
1	6	Texas	0	3,290	0	3,510	0	0	0	0	0	0
SIC 3369-- Nonferrous foundries												
1	10	New York	0	1	0	1	0	0	0	0	0	144
SIC 3441-- Fabricated structural metal												
1	4	Georgia	0	0	0	0	0	0	0	0	0	12,100
SIC 3443-- Fabricated plate work (boilers)												
1	6	Texas	0	3,560	0	0	0	0	0	0	0	0
SIC 3444-- Sheet metal work												
1	3	West Virginia	0	19,000	0	3,451	0	0	0	0	0	0
1	7	Kansas	0	11,500	0	14,460	0	0	0	0	0	0
SIC 3462-- Iron and steel forgings												
1	4	Tennessee	0	61,063	0	0	0	0	0	0	0	0
SIC 3496-- Miscellaneous fabricated wire products												
1	1	Massachusetts	0	172	0	0	0	0	0	0	0	0
SIC 3499-- Fabricated metal products, nec												
1	5	Illinois	0	0	0	0	0	0	0	0	2,336	0
SIC 3613-- Switchgear and switchboard apparatus												
1	6	Texas	0	0	0	0	0	0	0	0	0	10,629

			1999		2000		2001		2002		2003	
Number of Facilities	EPA Region	State	Onsite Recycle	Offsite Recycle	Onsite Recycle	Offsite Recycle	Onsite Recycle	Offsite Recycle	Onsite Recycle	Offsite Recycle	Onsite Recycle	Offsite Recycle
SIC 3691-- Storage Batteries												
1	5	Illinois	0	1,100	0	0	0	0	0	0	0	0
1	7	Kansas	0	0	0	2,600	0	619	0	34	0	0
SIC 3694-- Engine Electrical Equipment												
1	4	South Carolina	0	0	0	670	0	6,767	0	3,028	0	0